

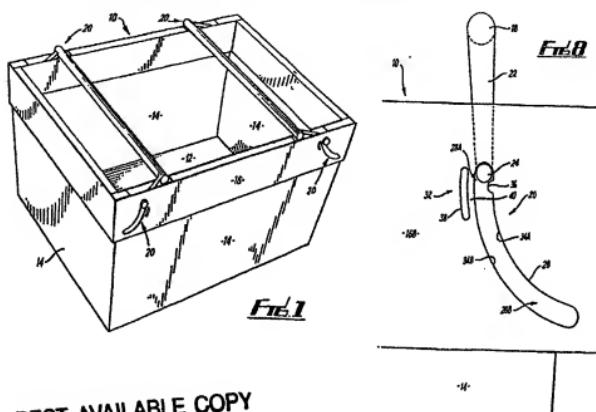
UK Patent Application (19) GB 2 373 239 (13) A

(43) Date of A Publication 18.09.2002

(21) Application No 0105170.5	(51) INT CL ⁷ B65D 21/06 21/04
(22) Date of Filing 02.03.2001	(52) UK CL (Edition T) BPP PU
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(54) Abstract Title
A Stackable and Nestable Container

(57) A container 10 has a base and upstanding walls 14 extending up to a rim 16 on which support members 18 are mounted. The support members are movable between stacking positions overlying the container mouth and a nesting position clear of the container mouth. The mounting means 20 includes a slot 28 defined in an outer wall 16B of rim 16 and a foot 24 of the support member 18 which is movable along the slot 28. Outer wall 16B is provided with a detent 36 to resist movement of the foot 24 so that the support member 18 can be held in an upper stacking position. The detent 36 is provided with associated resilience in the form of a second slot 38 which locally weakens the wall of the slot 28. This allows the foot 24 to move past the detent 36 when it is desired to move the support member 18 to the lower stacking position.

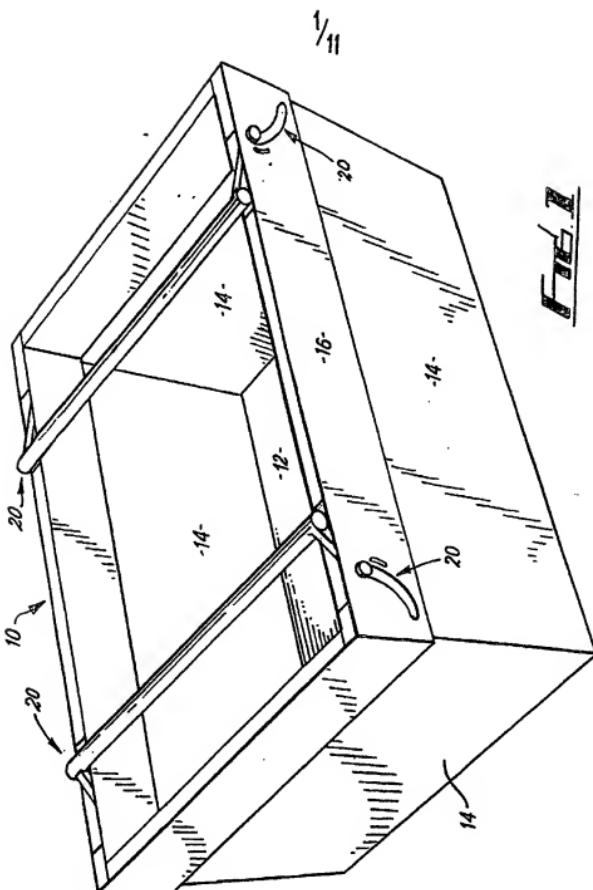


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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.
The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.
The print reflects an assignment of the application under the provisions of Section 30 of the Patents Act 1977.

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FIG. 7



20 + 4 02

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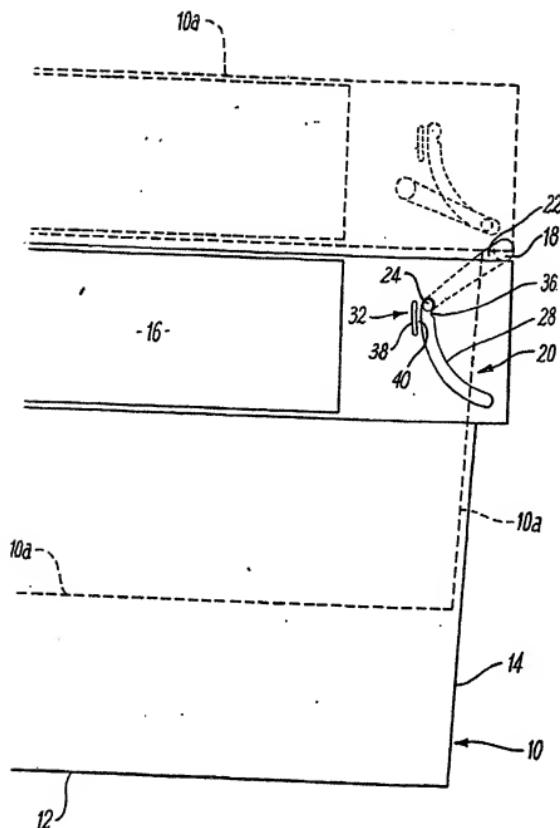
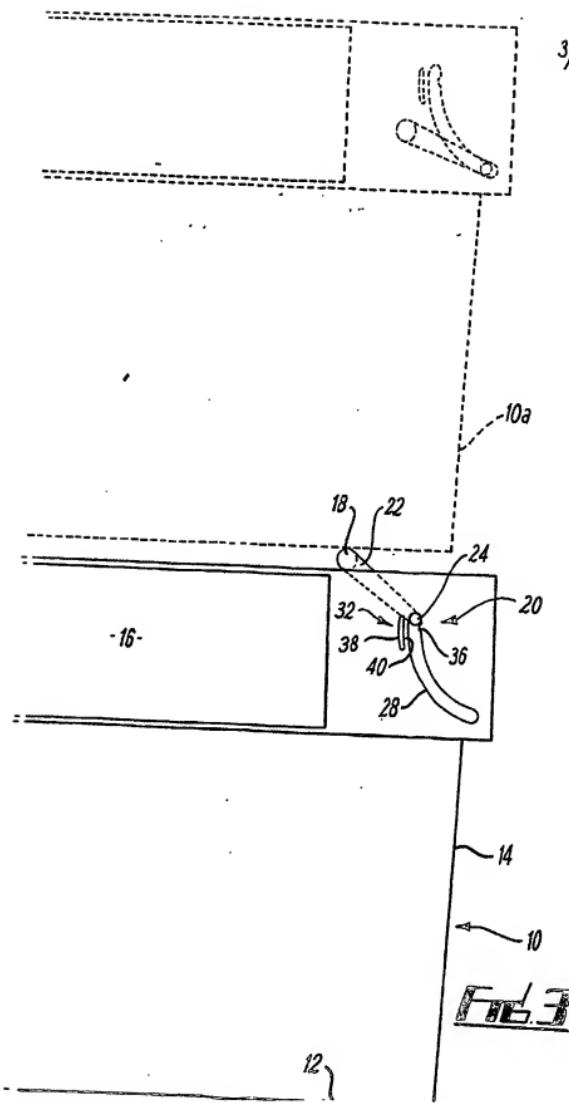


Fig. 2

29 44 02

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29 + 4 02

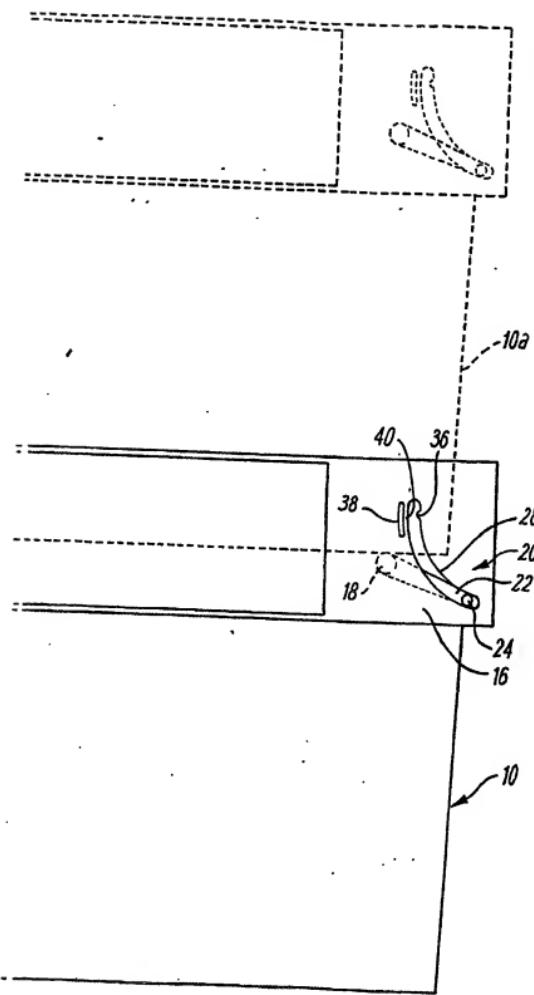


Fig 4

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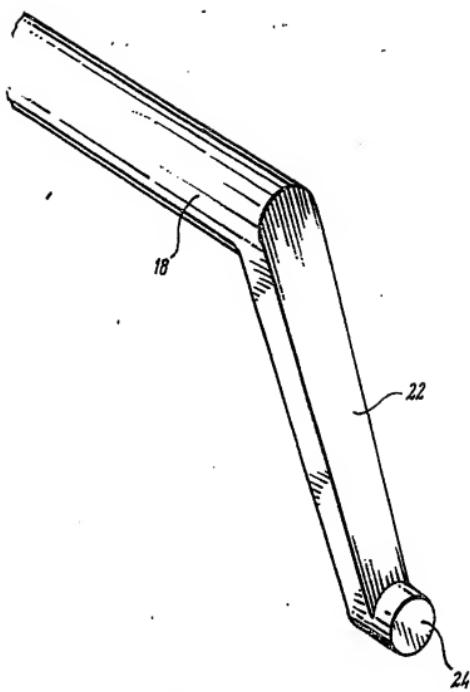


FIG. 5

29 + 4 02

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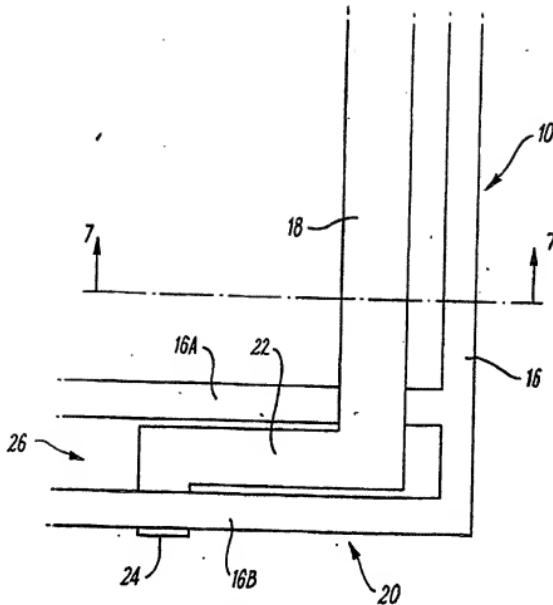
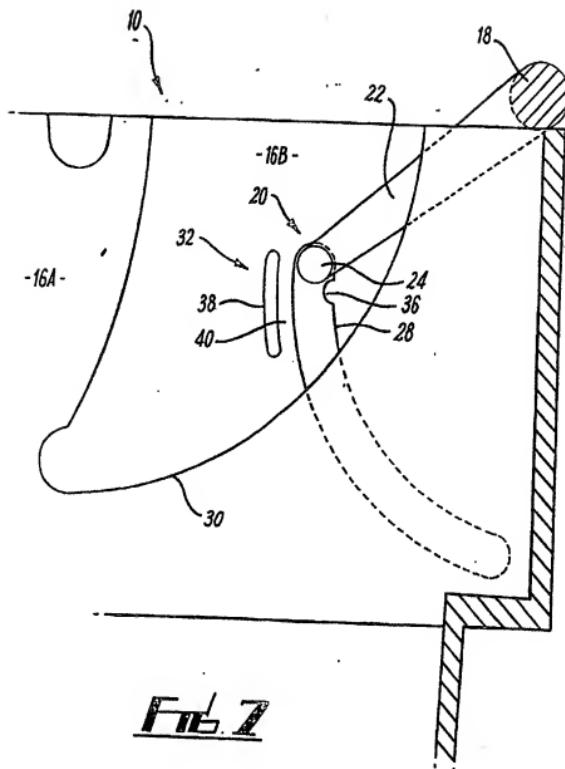


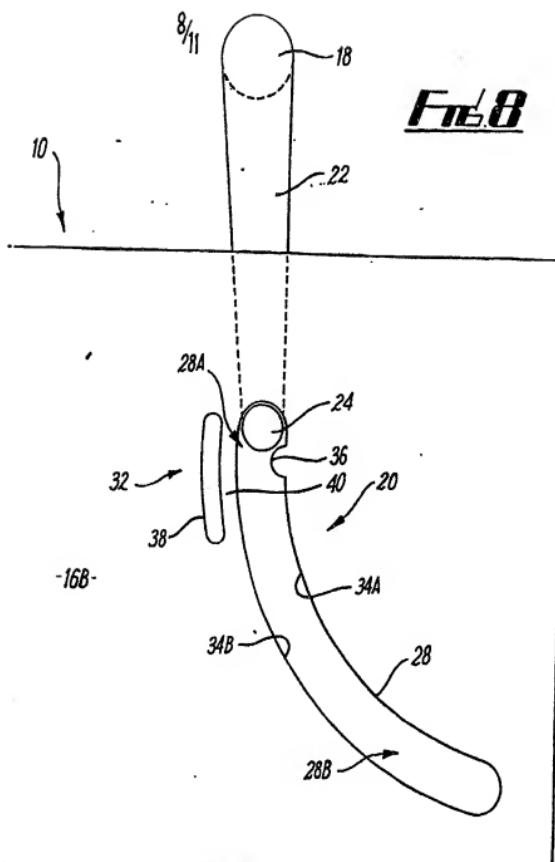
Fig. 6

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29 + 6.00



29 + 4 00

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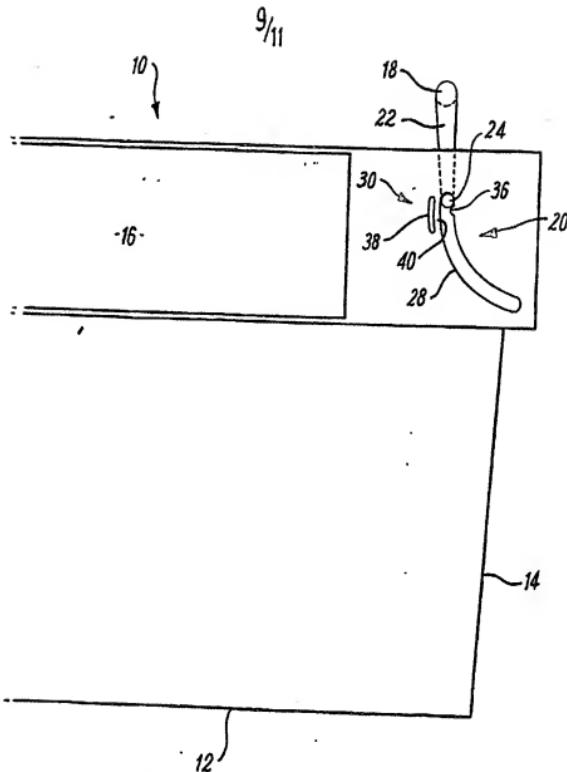


Fig. 9

29 + 4 02

10/11

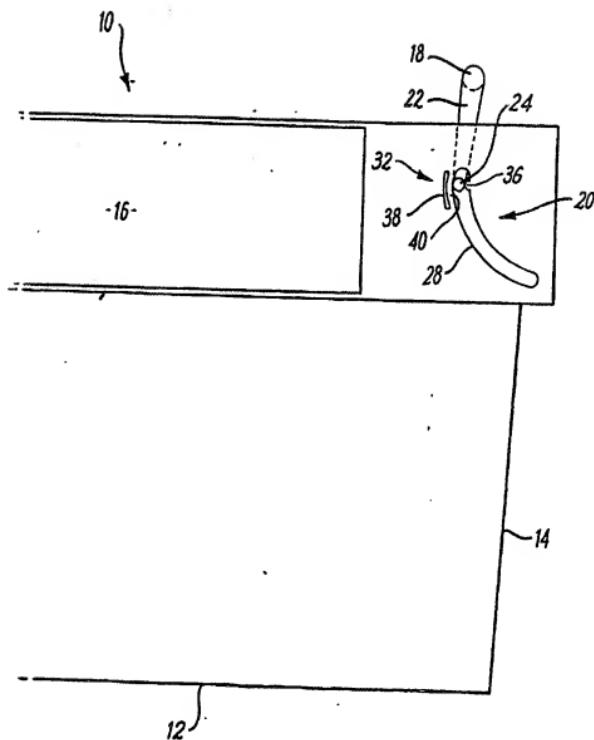


Fig. 10

29 + 4 02

11/11

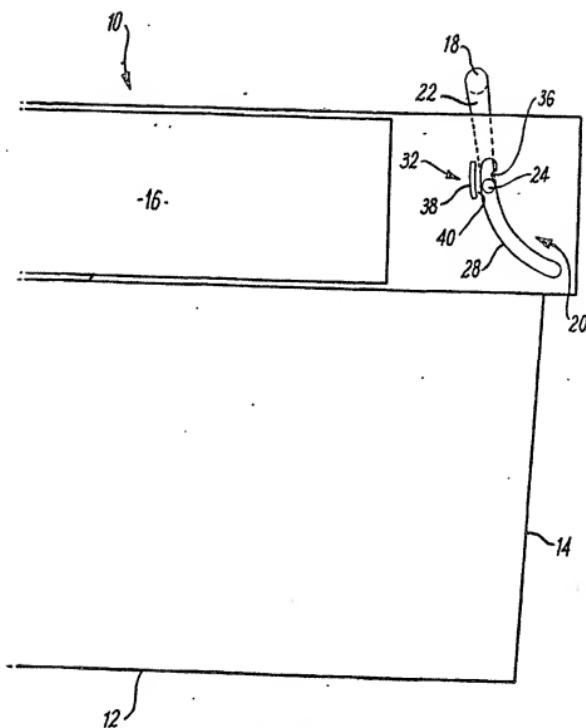


Fig 11

Container

The present invention relates to containers.

A conventional form of stacking and nesting container comprises two bale arms, stacking bars or support bars. These are pivotally attached to the sides of the container, to extend between the sides, usually at opposing ends of the container. Each support member can be moved from a nesting position to a support position. In the stacking position, a second container is supported by the support members to form a stack of containers. In the nesting position, the support members do not obstruct a second container, which can therefore nest in the container below. The result is to allow filled containers to be stacked, while allowing empty containers to be nested for compactness during storage, return transport or the like.

It has been proposed to provide more than one stacking position at different heights above the container base, to allow partially filled containers to be stacked with a smaller separation between their bases to avoid wasted space represented by the unfilled part of the containers.

The present invention provides a container having a base and comprising a support member movable between at least two positions relative to the base, at least one of the positions being a stacking position at which the support member is located to support a second container above the base to form a stack, the container further comprising mounting means by which the support member is mounted, the mounting means including a slot and a portion of the support member movable along the slot as the support member moves between positions, and wherein the slot is defined between two opposed walls, at least one of which is formed to provide a detent means which tends to resist movement of the said portion along the slot, there being resilience associated with the detent means to allow the said portion to be forced past the detent means.

The detent means may comprise a prominence formed in one of the opposed walls to provide a reduction in the width of the slot to detain the support member portion, the associated resilience allowing the reduced width portion of the slot to be widened when the resilience is overcome, to allow the support member portion to pass. The associated resilience may be provided by the other of the opposed walls, in the region of the prominence. The said other wall may be locally weakened to provide the associated resilience. The local weakening may be provided by a localised reduction in the material thickness of the said other wall. The localised reduction may be provided by the formation of a second slot spaced from the first slot along which the support member portion is movable, the first slot wall being provided by the material between the two slots.

Preferably the support member has two stacking positions at respective heights above the base, the support member portion being required to move past the detent means when the support member moves between the two stacking positions. The support member may have a nesting position at which a second container is unimpeded, to allow containers to be nested. The support member may have two stacking positions and a nesting position, the support member being movable between the nesting position and one of the stacking positions without overcoming the detent means, and to the other stacking position by overcoming the detent means. Preferably, the support member is able to reach the upper of the stacking positions from the nesting position without overcoming the detent means.

Examples of the present invention will now be described in more detail, by way of example only, and with reference to the accompanying drawings in which:

Fig. 1 is a schematic perspective view of a container according to the present invention;

Fig. 2 is a partial diagrammatic side elevation at one end of the container

of Fig. 1, illustrating the stacking bar in the nesting position;

Fig. 3 corresponds with Fig. 2, illustrating the stacking bar in an upper stacking position;

Fig. 4 corresponds with Figs. 2 and 3, showing the stacking bar in a lower stacking position;

Fig. 5 is a perspective view of one end of the stacking bar removed from the container and on an enlarged scale;

Fig. 6 is a partial plan view at one corner of the container;

Fig. 7 is a section viewed along the lines 7-7 in Fig. 6, with the stacking bar in the position illustrated in Fig. 3;

Fig. 8 is an enlarged side elevation showing a slot forming part of a mounting arrangement for support members;

Fig. 9 illustrates the stacking bar in an intermediate position between the nesting and upper stacking positions; and

Figs. 10 and 11 correspond with Fig. 9, illustrating other intermediate positions occupied by the support member when moving between the upper and lower stacking positions.

Fig. 1 illustrates a container 10 which has a base 12 and four upstanding walls 14 extending up to a rim 16 which carries support members 18. The support members 18 are mounted on the walls 14 in the region of the rim 16 in order to move between various different positions, as will be described. Briefly, the support members 18 have positions as shown in Fig. 1, in which they provide support for another container, allowing the formation of a container stack. In this embodiment, each support member 18 has two stacking positions

at different heights from the base 12, allowing filled containers to be stacked at full separation, or more closely when only partially full. The support members 18 also have nesting positions (not shown in Fig. 1) clear of the container mouth, allowing another container to be introduced into the container 10 from above, to nest therein. In order to allow nesting, the rim 16 is larger in plan than the base 12, and the walls 14 slope outwardly from the base 12 to the rim 16. When fully nested, the rim of one container will rest on the rim of a lower container. The base of the upper container will then usually be spaced only slightly above the base of the lower container, but this separation will depend on the particular design of the container. The main body of the container is preferably moulded from a thermoplastic material.

The three positions of the support members 18 are shown in Figs. 2, 3 and 4. Fig. 2 illustrates the nesting position. The support member 18 is clear of the mouth of the container 10, allowing nesting. In Fig. 3, the support member 18 is above the rim 16 but further inboard, in order to support a second container for stacking. In the lower stacking position illustrated in Fig. 4, the support member 18 is directly below its position in Fig. 3, allowing a second container to be stacked at a position intermediate the upper stacking position (Fig. 3) and the nesting position (Fig. 1). Figs. 2, 3 and 4 illustrate the position of second containers in the nested or stacked positions, by means of broken lines identified by the numeral 10a.

Movement of the support members 18 between the various positions is achieved by a mounting arrangement illustrated generally at 20 and which can now be described more fully. In doing so, the mounting arrangement 20 at one corner of the container 10 will be described. An equivalent mounting arrangement 20 is provided at each end of each support member 18.

Turning to Fig. 5, the support member 18 carries a leg 22 which is generally perpendicular to the support member 18, to extend down the side of the container 10. The leg 22 carries a foot 24 in the form of a short boss of circular section.

Other features of the mounting arrangement 20 are formed in the rim 16. The rim 16 consists of an inner wall 16A and an outer wall 16B between which a space 26 is defined (see Fig. 6). The space 26 is open above. The leg 22 reaches down into the space 26. The outer wall 16B has a curved through slot 28 (see e.g. Fig. 2) in which the foot 24 is located.

The foot 24 is able to rotate relative to the slot 28 and also to move along the slot 28 (subject to limitations to be described more fully below). Consequently, as can be seen from Figs. 2, 3 and 4, the nesting position (Fig. 2) and the upper stacking position (Fig. 3) can both be reached with the foot 24 at the top of the slot 28, by swinging the support member 18 between the two positions, turning the foot 24 in the slot 28. The lower stacking position (Fig. 4) is reached with the foot 24 at the lower end of the slot 28, with appropriate rotation about the foot 24. The inner wall 16a of the rim 16 is cut away at 30 to accommodate the support member 18 at the lower stacking position and in the required intermediate positions.

The positions of Figs. 2 and 3 both have the foot 24 at the top of the slot 28, as has been indicated. The foot 24 is detained at this upper position by a detent arrangement indicated generally at 32, see particularly Fig. 8. The slot 28 is formed between two opposed walls 34 which have substantially the same separation along substantially the whole of their length. The separation is slightly more than the diameter of the foot 24. However, the upper wall 34A carries a prominence or pip 36 near to its upper end. This provides a reduction in the width of the slot, separating the slot into an upper portion 28A and a lower portion 28B. The upper portion 28A is a relatively close fit with the foot 24, forming a socket in which the foot 24 can rotate, but virtually no movement of the foot 24 down the upper slot 28A is possible without abutting the pip 36. The pip 36 thus detains the foot 24 in the upper slot 28A, providing access for the support member 18 to the nesting or upper stacking positions (Figs. 2 and 3).

However, the detent provided by the arrangement 32 can be overcome, to

allow the foot 24 to move into the lower slot 28B and to the lower end of the slot 28, so that the support member 18 can move to the lower stacking position (Fig. 4). Overcoming the detent arrangement 32 is possible by the provision of resilience associated with the arrangement 32 in the region of the reduced width portion of the slot 28, that is, in the region of the pip 36.

In this example, the associated resilience is provided by the lower wall 34B but could alternatively be provided by resilience of the pip 36. In this example, the lower wall 34B is locally weakened by the formation of a second slot 38 which is relatively short and narrow in comparison with the slot 28, and runs behind the lower wall 34B in the vicinity of the pip 36. In the region of the pip 36, the wall 34B is thus provided by the relatively thin web of material 40 between the slots 28, 38. The second slot 38 may be a through slot or a channel formed in the outer rim wall 16B.

The localised reduction in the material thickness of the lower wall 34B results in a localised weakening of the wall 34B. Consequently, if the container 10 is formed of a resilient material such as a thermoplastic, the lower wall 34B is able to flex resiliently to bow away from the pip 36 and thus allow the foot 24 to be forced past the pip 36 by overcoming the resilience provided by the web 40.

In use, the stacking member may initially be in the nesting position (Fig. 2). The support member 18 can be lifted, by hand or by machine to turn the foot 24 in the upper slot 28A until the intermediate position (Fig. 9) is reached. The support member 18 can then continue to swing over, to reach the upper stacking position (Fig. 3). This movement can be reversed, to return to the nesting position.

Alternatively, when the support member 18 is in the intermediate position of Fig. 9, a downward force can be applied to force the foot 24 down between the pip 36 and the web 40, bowing the web 40 away from the pip 36, as the foot 24 moves down. Fig. 10 illustrates a position as the foot 24 moves past

the pip 36 in this manner. As can be seen in Fig. 10, the web 40 has bowed to deform the second slot 38 to a significant degree. As the foot 24 moves past the pip 36 (Fig. 11), the web 40 recovers to the original position. The foot 24 is now in the lower slot 28B and free to move down to the lower end as the support member 18 moves to the lower stacking position (Fig. 4).

Consequently, when the foot 24 is in the upper slot 28A, the support member 18 is free to move between the nesting and upper stacking positions, similar to the operation of conventional containers which have only a single stacking position. Indeed, it is expected that the container of the present invention would be fully compatible with those conventional containers, handling equipment and the like. However, the lower stacking position can be utilised when required, as described above. The ease with which the lower stacking position can be reached can be varied by adjusting the resilience associated with the arrangement 32, so that the force required to force the foot 24 past the pip 36 can be changed. This force will be varied by factors such as the shape of the pip 36, the width of the slot 28, the thickness of the web 40 and the nature of the material of which the various components are manufactured.

Various modifications can be made to the apparatus described above without departing from the invention. In particular, the shapes, sizes and relative dimensions of the various components can all be varied widely, according to the intended purpose of the container. Resilience can be provided by the choice of material for the pip or the foot 24, in addition to the formation of a web 40. However, the foot 24 is preferably moulded integrally with the leg 22 and support member 18, and thus of the same material, so that resilience of the foot 24 may be undesirable as causing a reduction in the strength of the support member 18. The wall 16 is described as having inner and outer leaves, but could be formed as a single leaf, with the leg 22 reaching down to the slot 28 from within or outside the container.

Whilst endeavouring in the foregoing specification to draw attention to

those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. A container having a base and comprising a support member movable between at least two positions relative to the base, at least one of the positions being a stacking position at which the support member is located to support a second container above the base to form a stack, the container further comprising mounting means by which the support member is mounted, the mounting means including a slot and a portion of the support member movable along the slot as the support member moves between positions, and wherein the slot is defined between two opposed walls, at least one of which is formed to provide a detent means which tends to resist movement of the said portion along the slot, there being resilience associated with the detent means to allow the said portion to be forced past the detent means.
2. A container according to claim 1, wherein the detent means comprises a prominence formed in one of the opposed walls to provide a reduction in the width of the slot to detain the support member portion, the associated resilience allowing the reduced width portion of the slot to be widened when the resilience is overcome, to allow the support member portion to pass.
3. A container according to claim 2, wherein the associated resilience is provided by the other of the opposed walls, in the region of the prominence.
4. A container according to claim 3, wherein the said other wall is locally weakened to provide the associated resilience.
5. A container according to claim 4, wherein the local weakening is provided by a localised reduction in the material thickness of the said other wall.
6. A container according to claim 5, wherein the localised reduction is provided by the formation of a second slot spaced from the first slot along which the support member portion is movable, the first slot wall being provided by the material between the two slots.

7. A container according to any of the preceding claims, wherein the support member has two stacking positions at respective heights above the base, the support member portion being required to move past the detent means when the support member moves between the two stacking positions.

8. A container according to any of the preceding claims, wherein the support member has a nesting position at which a second container is unimpeded, to allow containers to be nested.

9. A container according to any of claims 1 to 6, wherein the support member has two stacking positions and a nesting position, the support member being movable between the nesting position and one of the stacking positions without overcoming the detent means, and to the other stacking position by overcoming the detent means.

10. A container according to claim 9, wherein the support member is able to reach the upper of the stacking positions from the nesting position without overcoming the detent means.

11. A container substantially as hereinbefore described with reference to Figs. 1 to 11.

12. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.



Application No: GB 0105170.5
Claims searched: 1-11

Examiner: Marian Challis
Date of search: 9 July 2002

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.T): B8P (PK5, PU)

Int CI (Ed.7): B65D 21/02, 21/04, 21/06

Other: Online: PAJ, WPI and EPDOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2296009 (MCKECHANIE UK LTD.) Figures 7-9, item 102 particularly, pages 16,17,18 lines 19-24, 1-24 and 1-4 respectively	1-5,7-10
X	GB 2288593 (LINPAC MOULDINGS LTD.) Figures 7-10, item 26 particularly, page 13 lines 1-23	1,3-5,7-10

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